AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth hereinbelow.

1. **(cancelled)**A resonant optical filter, comprising:
   a. a first transmission optical waveguide;
   b. a second transmission optical waveguide; and
   c. an optical resonator , evanescently optically coupled to each of the first and second transmission waveguides for transferring a resonant optical signal between the first and second transmission waveguides.

2. **(currently amended)** ~~The resonant optical filter of Claim 1, wherein:~~

   A resonant optical filter, comprising:

   a. a first transmission optical waveguide;

   b. a second transmission optical waveguide; and

   c. an optical resonator , evanescently optically coupled to each of the first and second transmission waveguides for transferring a resonant optical signal between the first and second transmission waveguides,

   wherein:

   a. the first transmission optical waveguide transmits therethrough a plurality of optical signals, each carried by a respective waveguide optical mode corresponding to an optical channel of a WDM system;
   b. the second transmission optical waveguide being arranged to transmit therethrough a plurality of optical signals, each carried by a respective waveguide optical mode corresponding to an optical channel of a WDM system;
   c. each of the first and second transmission waveguides including an evanescent optical coupling segment therein; and,
   d. the optical resonator being positioned so that a portion of the resonant optical mode of the resonator at least partially spatially overlaps the evanescent portion of the optical mode in the first and second transmission waveguide optical coupling segments.

3. **(original)** The optical filter of Claim 2, wherein the optical resonator includes a plurality of optical resonator segments, at least two of the optical resonator segments being evanescently optically coupled therebetween.

4. **(original)** The resonant optical filter of Claim 3, wherein:
   a. an optical signal entering the resonant optical filter through the first transmission optical waveguide and carried by a WDM channel substantially resonant with an optical resonance of at least one of the optical resonators is substantially transferred from the first transmission of optical waveguide to the second transmission optical waveguide and leaves the resonant optical filter through the second transmission optical waveguide; and,
   b. an optical signal entering the resonant optical filter through the first transmission optical waveguide and carried by a WDM channel substantially non-resonant with any optical resonance of the coupled-optical-resonator system substantially remains within the first transmission optical waveguide and leaves the resonant optical filter through the first transmission optical waveguide.

5. **(original)** The resonant optical filter of Claim 3, wherein:
   a. an optical signal entering the resonant optical filter through the second transmission optical waveguide and carried by a WDM channel substantially resonant with an optical resonance of the coupled-optical-resonator system is substantially transferred from the second transmission optical waveguide to the first transmission optical waveguide and leaves the resonant optical filter through the first transmission optical waveguide; and,
   b. an optical signal entering the resonant optical filter through the second transmission optical waveguide and carried by a WDM channel substantially non-resonant with any optical resonance of the coupled-optical-resonator system substantially remains within the second transmission optical waveguide and leaves the resonant optical filter through the second transmission optical waveguide.

6. **(original)** The resonant optical filter of Claim 3 wherein the filter functions as an optical WDM slicer/interleaver.

7. **(original)** A resonant optical filter for an optical WDM system, comprising:

a. a first transmission fiber-optic waveguide, the waveguide having a fiber-optic-taper segment therein;

b. a second transmission fiber-optic waveguide, the second waveguide having a fiber-optic-taper segment therein;

c. a resonator fiber having at least one fiber-ring resonator segments formed thereon, each fiber-ring resonator being evanescently optically coupled together and thereby acting as a single fiber-ring resonator;

d. the resonator fiber further including a taper positioner for engaging the fiber-optic-taper segment of at least one of the first and second transmission fiber optic waveguides and so as to reproducibly establish and stably maintain an evanescent optical coupling of the fiber-ring resonator and at least one of the transmission fiber optic waveguides; and

e. wherein at least one of the fiber optic taper segments of the first and second transmission fiber optic waveguides is partially wrapped around a portion of an outer circumference of at least one fiber-ring resonator segment.

8. **(original)** The resonant optical filter of Claim 7 wherein the resonator fiber includes a delocalized-optical-mode suppressor.

9. **(original)** The resonant optical filter of Claim 8, wherein the resonant frequencies of the fiber-ring resonator segment have been modified by beam processing.

10. **(original)** The resonant optical filter of Claim 7 wherein at least one of the fiber-optic-taper segments of the first and second transmission fiber optic waveguides is longitudinally displaced from the longitudinal midpoint of at least one of the fiber-ring resonator segments, thereby substantially reducing undesirable taper-induced optical loss of at least one fiber-ring resonator segments.

11. **(original)** A method for dividing a plurality of optical signals transmitted by an optical WDM system comprising the steps of receiving a plurality of optical signals, each carried by the corresponding WDM channel, into a first transmission optical waveguide;

a. routing a first set of optical signals including at least one of the received optical signals into a second transmission optical waveguide, the first set of optical signals being substantially resonant with a fiber-ring resonator evanescently optically coupled to the first and second transmission optical waveguides; and,

b. permitting a second set of optical signals to pass undisturbed along the first transmission optical waveguide, the second set of optical signals including at least one of the received optical signals and the second set of optical signals being substantially non-resonant with any optical resonance of the fiber-ring resonator.

12. **(original)** A method for combining a plurality of optical signals transmitted by an optical WDM system, comprising the steps of:

a. receiving a first set of optical signals through a first transmission optical waveguide, the first waveguide being evanescently coupled to an optical resonator, the first set of optical signals being substantially non-resonant with any optical resonances of the optical resonator;

b. receiving a second set of optical signals through a second transmission optical waveguide, the second optical waveguide being evanescently optically coupled to an optical resonator, the second set of optical signals being substantially resonant with an optical resonance of the optical resonator; and,

c. routing through the optical resonator, at least one optical signal from the second set of optical signals to the first transmission optical waveguide, thereby adding an additional optical signal to the first set of optical signals transmitted in the first transmission waveguide.

13. **(original)** A method for dropping an optical signal transmitted by an optical WDM system comprising the steps of:

a. receiving a plurality of optical signals, each carried by the corresponding WDM channel, into the first transmission optical waveguide, the first waveguide being evanescently optically coupled to a circumferential-mode optical resonator and at least one of such signals is substantially resonant with an optical resonance of the circumferential-mode optical resonator; and at least

one of such signals is substantially non-resonant with an optical resonance of the circumferential-mode optical resonator; and,

b. routing to a second transmission optical waveguide the optical signals carried by a WDM channel substantially resonant with an optical resonance of the circumferential- mode optical resonator; the second waveguide also being evanescently optically coupled to a circumferential-mode optical resonator.

14. **(original)** A method for adding an optical signal transmitted by an optical WDM system comprising the steps of:

a. receiving a first plurality of optical signals, each carried by the corresponding WDM channel, from a first transmission optical waveguide, the first waveguide being evanescently optically coupled to a circumferential-mode optical resonator, such signals being substantially non-resonant with an optical resonance of the circumferential-mode optical resonator; and,

b. receiving a second plurality of optical signals, each carried by the corresponding WDM channel, from a second transmission optical waveguide, the second waveguide also being evanescently optically coupled to the circumferential-mode optical resonator, at least one of such second plurality of signals is substantially resonant with an optical resonance of the circumferential-mode optical resonator; and at least one of such second plurality of signals is substantially non-resonant with an optical resonance of the circumferential-mode optical resonator; and,

c. routing to the first transmission optical waveguide the optical signals from the second plurality of signals those signals which are substantially resonant with an optical resonance of the circumferential-mode optical resonator.

15. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

16. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a

resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

17. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of axially evanescently optically coupled fiber-ring optical resonators formed on a common resonator optical fiber, the plurality of fiber-ring optical resonators forming a coupled-optical-resonator system, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber and having a circumferential optical path length

sufficiently different from a circumferential optical path length of at least one immediately adjacent portion of the common resonator optical fiber so as to enable the plurality of fiber-ring optical resonators to support a plurality of substantially circumferential resonant optical modes near an outer circumferential surface of at least one of the fiber-ring optical resonators, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

18. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of radially evanescently optically coupled fiber-ring optical resonators, each of the fiber-ring optical resonators being formed on a corresponding one of at least two resonator optical fibers, the plurality of fiber-ring optical resonators forming a coupled-optical-resonator system, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with the corresponding resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one immediately adjacent portion of the corresponding resonator optical fiber so as to enable the plurality of fiber-ring optical resonators to support a

plurality of resonant optical modes near an outer circumferential surface of at least one of the fiber-ring optical resonators, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

19. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, a spectral width of at least one resonance band of the coupled-optical-resonator system being smaller than an optical channel spacing of the optical WDM system.

20. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, a spectral width of at least one resonance band of the coupled-optical-resonator system being substantially equal to an optical channel spacing of the optical WDM system.

21. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a

respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, at least one spacing between spectrally-adjacent resonance bands of the coupled-optical-resonator system being greater than an optical channel spacing of the optical WDM system.

22. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a plurality of optical resonators forming a coupled-optical-resonator system and including at least one fiber-ring optical resonator, the coupled-optical-resonator system being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, spectrally-adjacent resonance bands of the coupled-optical-resonator system being spaced by about an integer times an optical channel spacing of the optical WDM system.

23. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical

waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

24. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a

circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes.

25. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant

optical modes, a spectral width of at least one resonance of the fiber-ring optical resonator being smaller than an optical channel spacing of the optical WDM system.

26. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, a spectral width of at least one resonance of the fiber-ring optical resonator being substantially equal to an optical channel spacing of the optical WDM system.

27. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, at least one spacing between spectrally-adjacent resonances of the fiber-ring optical resonator being greater than an optical channel spacing of the optical WDM system.

28. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an

optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a single fiber-ring optical resonator, the fiber-ring optical resonator being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, the fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, spectrally-adjacent resonances of the fiber-ring optical resonator being spaced by about an integer times an optical channel spacing of the optical WDM system.

29. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being a polarization-preserving optical fiber and the evanescent optical coupling segment thereof being a fiber-optic taper segment.

30. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component, evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof, for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being an optical fiber and the evanescent optical coupling segment thereof being a side-etched optical fiber segment.

31. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes, the resonator optical fiber including at least one delocalized-optical-mode suppressor.

32. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being an optical fiber and the evanescent optical coupling segment thereof being a fiber-optic taper segment,

the resonator optical fiber including a fiber-optic taper positioning-and-support structure for engaging the fiber-optic taper segment so as to evanescently optically couple the resonant optical component and the fiber-optic taper segment through a fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator.

33. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the

optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being an optical fiber and the evanescent optical coupling segment thereof being a fiber-optic taper segment,

the resonator optical fiber including a fiber-optic taper positioning-and-support structure for engaging the fiber-optic taper segment so as to evanescently optically couple the resonant optical component and the fiber-optic taper segment through a fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator,

the fiber-optic-taper segment being engaged by the fiber-taper positioning-and-support structure at a location axially displaced from an axial midpoint of the fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator so as to substantially reduce undesirable fiber-optic-taper-induced optical loss of the fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator.

34. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse-resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being an optical fiber and the evanescent optical coupling segment thereof being a fiber-optic taper segment,

the resonator optical fiber including a fiber-optic taper positioning-and-support structure for engaging the fiber-optic taper segment so as to evanescently optically couple the resonant optical component and the fiber-optic taper

segment through a fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator,

the fiber-optic-taper segment being engaged by the fiber-taper positioning-and-support structure at a location radially displaced from an outer circumference of the fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator so as to substantially reduce undesirable fiber-optic-taper-induced optical loss of the fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator.

35. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

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a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment; and

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical

resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes,

at least one of the first transmission optical waveguide and the second transmission optical waveguide being an optical fiber and the evanescent optical coupling segment thereof being a fiber-optic taper segment,

the fiber-optic-taper segment being partially wrapped around a fiber-optic-taper-segment-coupled one of the at least one fiber-ring optical resonator near a portion of an outer circumference thereof.

36. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, the second transmission optical waveguide having an evanescent optical coupling segment;

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes; and

a modulator switchable between first and second operational states for controlling transfer of the resonant optical signal between the first transmission optical

waveguide and the second transmission optical waveguide, the modulator substantially enabling transfer of the resonant optical signal while in the first operational state and substantially preventing transfer of the resonant optical signal while in the second operational state.

37. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an ~~evanescent optical coupling segment~~;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment;

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes; and

a modulator switchable between first and second operational states for controlling transfer of the resonant optical signal between the first transmission optical

waveguide and the second transmission optical waveguide, the modulator substantially enabling transfer of the resonant optical signal while in the first operational state and substantially preventing transfer of the resonant optical signal while in the second operational state.

38. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment;

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes; and

a modulator switchable between first and second operational states for controlling optical loss the resonant optical component, the modulator substantially

enabling transfer of the resonant optical signal while in the first operational state and substantially preventing transfer of the resonant optical signal while in the second operational state.

39. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment;

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes; and

a modulator switchable between first and second operational states for controlling evanescent optical coupling between the resonant optical component and at least one of the first transmission optical waveguide and the second

transmission optical waveguide, the modulator substantially enabling transfer of the resonant optical signal while in the first operational state and substantially preventing transfer of the resonant optical signal while in the second operational state.

40. **(previously added)** A resonant optical filter, comprising:

a first transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of an optical WDM system, the first transmission optical waveguide having an evanescent optical coupling segment;

a second transmission optical waveguide adapted for transmitting therethrough a plurality of optical signals, each of the optical signals being carried by a respective waveguide optical mode corresponding to an optical channel of the optical WDM system, the second transmission optical waveguide having an evanescent optical coupling segment;

a resonant optical component including at least one fiber-ring optical resonator, the resonant optical component being evanescently optically coupled to each of the first transmission optical waveguide and the second transmission optical waveguide at the respective evanescent optical coupling segment thereof for transferring a resonant optical signal between the first transmission optical waveguide and the second transmission optical waveguide, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator, the resonant optical signal being substantially resonant with at least one of the resonant optical modes; and

a modulator switchable between first and second operational states for controlling an optical resonance frequency of the resonant optical component, the

modulator substantially enabling transfer of the resonant optical signal while in the first operational state and substantially preventing transfer of the resonant optical signal while in the second operational state.

41. **(previously added)** A method for dividing a plurality of optical signals transmitted by an optical WDM system, comprising the steps of:

a. receiving a plurality of optical signals, each carried by a corresponding optical WDM channel, through a first transmission optical waveguide, the first transmission optical waveguide being evanescently optically coupled to a resonant optical component;

b. permitting a non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

c. routing a resonant subset of the received optical signals from the first transmission optical waveguide through the resonant optical component and into a second transmission optical waveguide, the second transmission optical waveguide being evanescently optically coupled to the resonant optical component, each of the resonant subset of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby dividing the non-resonant and resonant subsets of the received optical signals into the first and second transmission optical waveguides, respectively,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.

42. **(previously added)** A method for combining a plurality of optical signals transmitted by an optical WDM system, comprising the steps of:

a. receiving a non-resonant subset of a plurality of received optical signals, each carried by a corresponding optical WDM channel, through a first transmission optical waveguide, the first transmission optical waveguide being evanescently coupled to a resonant optical component;

b. receiving a resonant subset of the plurality of received optical signals, each carried by a corresponding optical WDM channel, through a second transmission optical waveguide, the second transmission optical waveguide being evanescently coupled to the resonant optical component;

c. permitting the non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

d. routing the resonant subset of the received optical signals from the second transmission optical waveguide through the resonant optical component and into the first transmission optical waveguide, each of the resonant subset of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby combining the resonant and non-resonant subsets of the received optical signals into the first transmission optical waveguide,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.

43. **(previously added)** A method for dropping an optical signal from a plurality of optical signals transmitted by an optical WDM system, comprising the steps of:

a. receiving a plurality of optical signals, each carried by a corresponding optical WDM channel, through a first transmission optical waveguide, the first transmission optical waveguide being evanescently optically coupled to a resonant optical component;

b. permitting a non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

c. routing a resonant one of the received optical signals from the first transmission optical waveguide through the resonant optical component and into a second transmission optical waveguide, the second transmission optical waveguide being evanescently optically coupled to the resonant optical component, the resonant one of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby dropping the resonant one of the received optical signals from the first transmission optical waveguide into the second transmission optical waveguide,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.

44. **(previously added)** A method for adding an optical signal to a plurality of optical signals transmitted by an optical WDM system, comprising the steps of:

a. receiving a non-resonant subset of a plurality of received optical signals, each carried by a corresponding optical WDM channel, through a first transmission optical waveguide, the first transmission optical waveguide being evanescently coupled to a resonant optical component;

b. receiving a resonant one of the plurality of received optical signals, carried by a corresponding optical WDM channel, through a second transmission optical waveguide, the second transmission optical waveguide being evanescently coupled to the resonant optical component;

c. permitting the non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

d. routing the resonant one of the received optical signals from the second transmission optical waveguide through the resonant optical component and into the first transmission optical waveguide, the resonant one of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby adding the resonant one of the received optical signals to the non-resonant subset of the received optical signals in the first transmission optical waveguide,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.

45. **(previously added)** A method for dividing a plurality of optical signals, comprising the steps of:

a. receiving a plurality of optical signals through a first transmission optical waveguide, the first transmission optical waveguide being evanescently optically coupled to a resonant optical component;

b. permitting a non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

c. routing a resonant subset of the received optical signals from the first transmission optical waveguide through the resonant optical component and into a second transmission optical waveguide, the second transmission optical waveguide being evanescently optically coupled to the resonant optical component, each of the resonant subset of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby dividing the non-resonant and resonant subsets of the received optical signals into the first and second transmission optical waveguides, respectively,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.

46. **(previously added)** A method for dropping an optical signal from a plurality of optical signals, comprising the steps of:

a. receiving a plurality of optical signals through a first transmission optical waveguide, the first transmission optical waveguide being evanescently optically coupled to a resonant optical component;

b. permitting a non-resonant subset of the received optical signals to pass substantially undisturbed through the first transmission optical waveguide, each of the non-resonant subset of the received optical signals being substantially non-resonant with any resonant optical mode of the resonant optical component; and

c. routing a resonant one of the received optical signals from the first transmission optical waveguide through the resonant optical component and into a second transmission optical waveguide, the second transmission optical waveguide being evanescently optically coupled to the resonant optical component, the resonant one of the received optical signals being substantially resonant with at least one corresponding resonant optical mode of the resonant optical component, thereby dropping the resonant one of the received optical signals from the first transmission optical waveguide into the second transmission optical waveguide,

the resonant optical component including at least one fiber-ring optical resonator, each fiber-ring optical resonator including a transverse resonator segment integral with a resonator optical fiber between first and second segments of the resonator optical fiber and having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the fiber-ring optical resonator.